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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,719	03/29/2004	Michael A. Rothman	42P18654	1421
45209	7590	03/16/2010	EXAMINER	
INTEL/BSTZ			HOANG, DANIEL L	
BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP			ART UNIT	
1279 OAKMEAD PARKWAY			PAPER NUMBER	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/811,719

**Applicant(s)**

ROTHMAN ET AL.

**Examiner**

DANIEL L. HOANG

**Art Unit**

2436

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 November 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6, 8-16, 18 and 20-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-16, 18, 20-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-06)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### RESPONSE TO ARGUMENTS

Applicant's amendments and arguments submitted on 11/19/09 are fully considered and arguments are moot in view of new ground of rejection.

### CLAIMS PRESENTED

Claims 1-6, 8-16, 18, 20-26 are presented.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**1. Claims 1-6, 9-16, 20-25 rejected under 35 U.S.C. 103(a) as being unpatentable over Reinert, US Patent No. 6347375, and Arnold, US Patent No. 6279128 and in view of Let al. USPN 7356679 B1.**

**As per claim 1, 12, 20:**

**Reinert teaches:**

A method, comprising:

initializing a virus scanner during a pre-boot phase of a computer system;

*[see col. 7, lines 46-59]*

scrubbing data read from an input/output (I/O) device of the computer system during the pre-boot phase by the virus scanner using a virus signature database before the data is loaded, wherein

the virus signature database is stored in a place not exposed to the operating system and is updated during the pre-boot phase; and

*[see col. 8, lines 20-45, wherein the virus signature file is downloaded and stored in the computers local memory, away from the hard disk and not exposed to the operating system]]*

enacting a platform policy if a virus is detected in the data.

*[see col. 8, lines 46-60]*

*Reinert has been discussed above. Reinert is mute in teaching "determining whether to perform a memory scrub based on a platform policy". For this limitation, examiner relies upon the Arnold reference. Arnold teaches an autonomous system for recognition of patterns formed by stored data during computer memory scrubbing (see col. 3, lines 65-67, and col. 4, lines 1-21). It would have been obvious to one of ordinary skill in the art to modify the invention taught by Reinert to implement the memory scrubbing techniques taught by Arnold so that it would be possible to uncover inactive computer virus signatures in a memory subsystem. Doing so during the pre-boot phase, as suggested by the Reinert invention would allow the scrubbing to be done passively and autonomously and transparently as desired by Arnold. (see col. 3, lines 54-62)*

The combination fails to teach "wherein the virus scanner is executing in a virtual machine monitor (VMM) executing on the computer system, the VMM supporting at least one virtual machine (VM) executing on the computer system, wherein the VM executes an operating system that is different from the VMM and the operating systems executed by other VMs and the VMM acts as an input/output (I/O) controller for requests to selected I/O ports".

However Le et al. teaches wherein the virus scanner is executing in a virtual machine monitor (VMM) executing on the computer system (**see figs 8, col. 68 lines 32-35, col. 86 lines 31-36 and col. 58 lines 59-62; program**

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**executed on Virtual Machine Monitor 6300 ... virus scanner program on VMM 6300),** the VMM supporting at least one virtual machine (VM) executing on the computer system **(see fig. 8; VM1 and VM2),** wherein the VM executes an operating system that is different from the VMM **(see col. 68 lines 32-54 and fig. 8; the VMs execute different operating systems from the monitor and/or controller VMM 6300)** and the operating systems executed by other VMs and the VMM acts as an input/output (I/O) controller for requests to selected I/O ports **(see col. 58 lines 56-65, col. 67 lines 52-64 and col. 87 lines 29-41; user selected I/O port requests controlled by other VMs and VMM application(s)) and VM supported by the VMM (see fig. 8).**

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify Reinert to execute virus scanner on a VMM.

**As per claim 2, Reinert teaches:**

The method of claim 1, further comprising scrubbing contents of a memory device of the computer system during the pre-boot phase by the virus scanner.

*[see col. 8, lines 24-32]*

**As per claim 3, 13, Reinert teaches:**

The method of claim 1, further comprising updating the virus signature database with updated virus signatures.

*[see col. 8, lines 33-35]*

**As per claim 4, Reinert teaches:**

The method of claim 3 wherein the virus signature database is updated during the pre-boot phase.

*[see col. 7, lines 60-67 and col. 8, lines 1-19, wherein control of the computer is transferred to the remote computer prior to loading of the operating system and the remote computer keeps the virus signature file up to date]*

**As per claim 5, 14, Reinert teaches:**

The method of claim 1 wherein the virus signature database is not exposed to an operating system executing on the computer system.

*[see rejection of claim 1]*

**As per claim 6, 22, Reinert teaches:**

The method of claim 5 wherein the virus signature database is stored in a firmware-reserved area.

*[see rejection of claim 1, wherein the virus signature file is stored in the local memory]*

**As per claim 9, 15, 24, Reinert teaches:**

The method of claim 1 wherein the virus scanner is operable during the pre-boot phase, an operating system (OS) runtime phase, and an after-life phase of the computer system independent of an operating system of the computer system.

*[see col. 7, lines 27-45]*

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**As per claim 10, 16, 25, Reinert teaches:**

The method of claim 1 wherein the virus scanner scrubs the data without having knowledge of a file system of the data.

*[see col. 8, lines 30-35]*

**As per claim 11, Reinert teaches:**

The method of claim 1, further comprising enacting the platform policy if the virus scanner detects non-normal behavior within the computer system.

**As per claims 17-18**, the combination teaches the method wherein scrubbing data read from the I/O device includes: receiving a request from a requester to read data from the I/O device, the requester in a VM of the at least one VM (**Le et al. fig. 8, col. 58 lines 56-65, col. 67 lines 52-64 and col. 87 lines 29-41**); loading at least a portion of the requested data into a buffer (**Le et al. col. 58 lines 56-65, col. 67 lines 52-64 and col. 87 lines 29-41 and Reinert col. 8 lines 20-45**); scrubbing the at least a portion of the requested data with the virus scanner (**Reinert col. 8 lines 20-45 and 46-60**); returning an error signal to the requester if the virus scanner detects a virus in the at least a portion of the requested data; and forwarding the requested data to the requester if the virus scanner does not detect a virus in the at least a portion of the requested data (**Reinert col. 7 lines 4-20 and Le et al. fig. 8**). The rationale for combining are the same as claim 1 above.

**As per claim 21, Reinert teaches:**

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The computer system of claim 20, further comprising a network interface operatively coupled to the processor, the virus scanner to scrub data read from the network interface using the virus signature database before the data is loaded in the memory device.

*[see col. 8, lines 61-67]*

**As per claim 23, Reinert teaches:**

The system of claim 20 wherein execution of the firmware instructions further perform operations comprising updating the virus signature database with updated virus signatures downloaded from an external virus signature repository communicatively coupled to the computer system.

*[see col. 8, lines 20-25]*

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will



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the statutory period for reply expire later than SIX MONTHS from the date of this final action.

- \*. Any response to this Office Action should be **faxed to (571) 273-8300 or mailed to:**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**Hand-delivered responses** should be brought to

Customer Service Window  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

- \*. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel L. Hoang whose telephone number is 571-270-1019. The examiner can normally be reached on Monday - Thursday, 8:00 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nasser Moazzami can be reached on 571-272-4195. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Daniel L. Hoang/

Examiner, Art Unit 2436

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/Nasser Moazzami/

Supervisory Patent Examiner, Art Unit 2436